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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,769	02/25/2002	George G. Barclay	51065	4396

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EXAMINER
THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
1752	8

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/082,769	Applicant(s) BARCLAY ET AL.	
	Examiner Yvette C. Thornton	Art Unit 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 15-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 15-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

This is written in reference to application number 10/082769 filed on February 25, 2002, and published as US 2002/0187420 A1 on December 12, 2002. The said application claims priority to provisional application 60/271404 filed on February 25, 2001.

Notice

1. The papers filed on ***July 24, 2002*** (certificate of mailing dated ***July 18, 2002***) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS
ORIGINALLY FILED

If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

Information Disclosure Statement

2. The Information Disclosure Statement filed on February 21, 2003 has been entered and fully considered.

Response to Amendment

3. The preliminary amendments filed on September 16, 2002 have been entered and fully considered.

4. Claims 13-14 and 17-25 have been cancelled. Claims 1-12 and 15-16 are currently pending.

Claim Objections

5. Claim 15 is objected to because of the following informalities: the amended claim contains the phrase "the photoresist composition of any one of claim 1". The examiner suggests deleting the phrase "any one of" for better clarity.

6. Claim 11 is objected to because of the following informalities: the claim states that, "the polymer is substantially of aromatic groups." The examiner believes that this is a typographical error and should state that the polymer is substantially *free* of aromatic groups. This position is supported by the specification on page 6, lines 2-3 which teaches that particularly preferred polymers are completely free of aromatic groups. The claim has been examined in light of the specification. Appropriation correction is requested.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

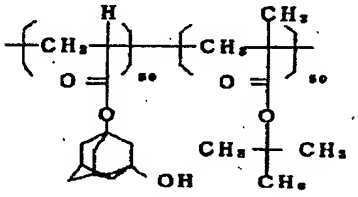
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. The examiner notes that there is a plethora of references, which could be cited under 35 USC 102. For the sake brevity, a few rejections will be made and the others references cited as pertinent art.

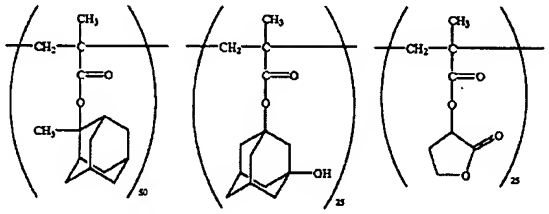
9. Claims 1-5, 10-12 and 15-16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Miyake et al. (JP 11-109632 A, machine translation). Miyake exemplifies a resist composition comprising a resin having the following formula



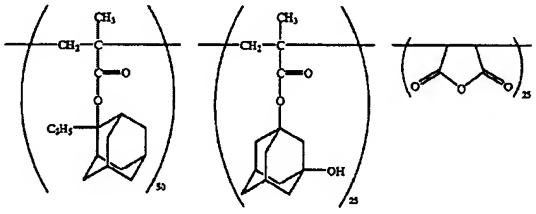
(10); an acid generator triphenylsulfonium hexafluoroantimony; and a cyclohexanone as a solvent. The said composition was coated on a silicon wafer; exposed with KrF excimer stepper and developed to form a semiconductor having a line and space pattern of 0.50 micrometer (p. 0039-0042). It is the examiner's position that the first monomer of formula (10) meets the limitation of a hydroxyadamantyl unit provided by polymerization of a (meth)acrylate as set forth in claim 2. The t-butyl group of the second monomer meets the limitations of a photoacid labile ester group, which is not an alicyclic moiety as set forth in instant claims 3, 5, and 10. Furthermore the examiner is of the

position that a silicon wafer meets the limitation of a microelectronic wafer substrate as set forth in instant claim 15.

10. Claims 1-5, 7-8, 10-12 and 15-16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fujishima et al. (EP 982628 A2). Fujishima exemplifies the synthesis of resin A and resin D that have the following structures:

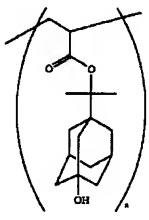
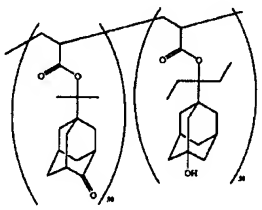
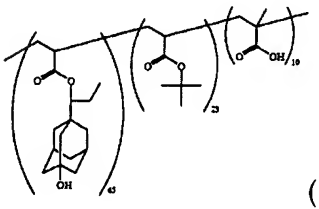
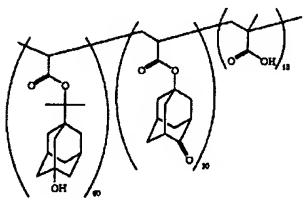
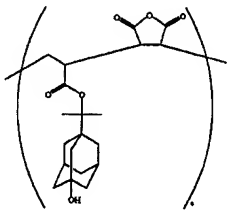


(resin A; p. 0035)

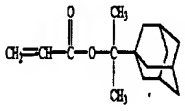


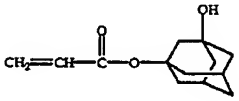
(resin D; p. 0039). Example 1 forms a photoresist composition comprising resin D; p-tolyldiphenylsulfonium trifluoromethanesulfonate as an acid generator; 2,6-diisopropylaniline as a quencher; and 2-heptanone as the solvent. The said composition was applied to a silicon wafer; exposed using a KrF excimer stepper; and developed to form a pattern (p. 0047-0049). Example 11 forms a photoresist composition comprising resin A; p-tolyldiphenylsulfonium perfluorooctane sulfonate as an acid generator; 2,6-diisopropylaniline as a quencher; and propylene glycol monomethyl ether acetate and γ-butyrolactone as the solvent mixture. The said composition was applied to a silicon wafer; exposed using an ArF excimer stepper; and developed to form a pattern (p. 0052-0054). It is the examiner's position that the second monomer in each of resins A and D meets the limitation of a hydroxyadamantyl unit provided by polymerization of a (meth)acrylate as set forth in claim 2. The third monomer of resin A meets the

limitations of a lactone and the third monomer of resin D meets the limitation of an anhydride as set forth in instant claim 10. The said third monomers also meet the limitations of a monomer comprising ethylene unsaturated carbonyl or di-carbonyl as in instant claim 7. The first monomer of each of the resins A and D meets the limitation of an alicyclic acid labile ester group as set forth in instant claims 3-5. Furthermore the examiner is of the position that a silicon wafer meets the limitation of a microelectronic wafer substrate as set forth in instant claim 15.

11. Claims 1-5, 7-8, 10-12 and 15-16 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Okino et al. (US 6303266 B1). Okino exemplifies synthesis examples I-1, I-2, I-3, I-5 and I-7, which anticipate the claimed invention. The said examples have the following structures respectively:  (I-1),  (I-2),  (I-3),  (I-5), and  (I-7) (c. 35-c. 39). Each of the said polymers was admixed with triphenylsulfonium triflate and ethyl lactate to form a photoresist solution. The said solution was spin-coated on to a silicon wafer; exposed to ArF excimer laser and developed (c. 41, l. 19-c. 43, l. 4). It is the examiner's position that the monomer of resin (I-1), monomer 2 of resin (I-2), monomer 1 of resins (I-3), (I-5) and (I-7) all meet the limitation of a hydroxyadamantyl unit provided by

polymerization of a (meth)acrylate as set forth in claim 2. Monomer 1 of resin (I-2) and monomer 2 of resin (I-5) meet the limitation of a lactone as set forth in instant claim 10; and an alicyclic acid labile ester group as set forth in instant claims 3-5. Monomer 2 of resin (I-7) meets the limitations of a monomer comprising ethylene unsaturated carbonyl or di-carbonyl as in instant claim 7 and an anhydride as set forth in instant claims 10. Monomer 2 of resin (I-3) meets the limitation of a photoacid labile group that contains a leaving group that is not an alicyclic moiety as in instant claim 10. Furthermore the examiner is of the position that a silicon wafer meets the limitation of a microelectronic wafer substrate as set forth in instant claim 15.

12. Claims 1-12 and 15-16 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Uetani et al. (US 2001/0039080 A1). Uetani exemplifies the synthesis of 1-(1-adamantyl)-1-methylethyl acrylate/3-hydroxy-1-adamantyl acrylate/norbornene/maleic anhydride tetrapolymer as resin A2 (p. 0107-0109). 1-(1-adamantyl)-1-methylethyl acrylate has the structure:  (p. 0105) which meets the limitation of an alicyclic acid labile ester group as in instant claims 3-5. 3-hydroxy-1-adamantyl acrylate has the structure:

 (p. 0108), which meets the limitation of a hydroxyadamantyl unit provided by polymerization with a (meth)acrylate as in instant claim 2. The norbornene monomer meets the limitation of a cyclic olefin as claimed in instant claim 6. The maleic anhydride monomer unit meets the limitations of instant claims 7 and 10. The said resin

was admixed with p-tolyldiphenylsulfonium trifluoromethane sulfonates as an acid generator; 2,6-diisopropylaniline as a quencher; and propylene glycol monomethyl ether acetate and γ-butyrolactone as the solvent mixture. The said mixture was applied to a silicon wafer; exposed with an ArF excimer stepper; and developed to form a pattern. It is the examiner's position that the said silicon wafer meets the limitation of a microelectronic wafer substrate as set forth in instant claim 15.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Nakanishi et al. (US 6537726 B2) pertaining to a chemical amplified type positive resist composition (see examples).
- Nozaki et al (US 6506534 B1) pertaining to negative resist composition, method for the formation of resist patterns and process for the production of electronic devices (see ex. 4-5).
- Hada et al. (US 2002/0068238 A1) pertaining to a positive-working photoresist composition (see ex. 1).
- Nishimura et al. (US 2002/0132181 A1) pertaining to a radiation sensitive resin composition (see synthesis example 3 and 7).
- Uetani et al. (US 6495306 B2) pertaining to a chemically amplified positive resist composition.
- Sato et al. (US 6479211 B1) pertaining to a positive photoresist composition for far UV exposure.
- Ushirogouchi et al. (US 6440636 B1) pertaining to polymeric compound and resin composition for photoresist (see examples).
- Uetani et al. (US 6383713 B1) pertaining to a chemical amplification type positive resist composition (see resin C, ex. 1-6).

- Fujishima et al. (US 6239231 B1) pertaining to a chemical amplifying type positive resist composition (see examples).
- Kamiya et al. (JP 2000-227658 A, machine translation), pertaining to a chemically sensitized positive resist composition.
- Fujishima et al. (JP 2000-275843, machine translation) pertaining to a chemically sensitized positive resist composition.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

16. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.

Yvette C. Thornton

Yvette Clarke Thornton
Junior Examiner
Art Unit 1752

yct
April 22, 2003